

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A liquid crystal display device comprising:

a liquid crystal panel comprising a first substrate, a second substrate and a liquid crystal layer, said liquid crystal layer comprising liquid crystal having negative dielectric anisotropy provided between the first and second substrates; and

a drive voltage setting section which sets a drive voltage to drive the liquid crystal panel and supplies the set drive voltage to the liquid crystal panel,

wherein:

the drive voltage setting section sets a drive voltage in accordance with viewing angle characteristics of the liquid crystal panel, thereby controlling viewing angle characteristics, and switches between wide viewing angle characteristics and narrow viewing angle characteristics, wherein

the drive voltage is such that the transmission intensity at oblique viewing angle is increased to strengthen excess brightness and grayscale inversion, achieving narrow viewing angle characteristics, and the transmission intensity at oblique viewing angle is decreased to weaken the excess brightness and grayscale inversion, achieving wide viewing angle characteristics, wherein

in narrow viewing angle operation, a black voltage at the lower end of grayscale at oblique viewing angle which is a drive voltage to be supplied to the liquid crystal pane is set to be larger than a black voltage having basic characteristics,

in wide viewing angle operation, a white voltage at the higher end of grayscale at oblique viewing angle is set to be a voltage which does not cause grayscale inversion while the black voltage at the lower end of grayscale at oblique viewing angle which is a drive voltage to be supplied to the liquid crystal panel has basic characteristics, and wherein

the basic characteristics indicate display characteristics where the transmission intensity at the oblique viewing angle is larger than the transmission intensity at the front when the liquid crystal panel is not subjected to the viewing angle control.

2. (Original) The liquid crystal display device according to claim 1, wherein: the drive voltage setting section sets a drive voltage for a lower end of grayscale to be supplied to the liquid crystal panel with narrow viewing angle characteristics so as to be higher than a drive voltage for a lower end of grayscale to be supplied to the liquid crystal panel with wide viewing angle characteristics.

3. (Original) The liquid crystal display device according to claim 1, wherein: the drive voltage setting section sets a drive voltage for a higher end of grayscale to be supplied to the liquid crystal panel, so as to be a voltage on which grayscale degradation occurs at the oblique viewing angle.

4. (Original) The liquid crystal display device according to claim 1, wherein: the drive voltage setting section, when transmission intensity of the liquid crystal panel has such a magnitude that grayscale inversions occur on a higher end of grayscale at the oblique viewing angle, sets a drive voltage for a higher end of grayscale to be supplied to the liquid crystal panel

with wide viewing angle characteristics to be a voltage on which no grayscale degradation occurs at the oblique viewing angle.

5. (Original) The liquid crystal display device according to claim 4, wherein: the drive voltage setting section does not change a drive voltage for a lower end of grayscale to be supplied to the liquid crystal panel.

6. (Original) The liquid crystal display device according to claim 1, wherein: the drive voltage setting section sets a drive voltage with reference to a lookup table, set in advance, representing a relationship between an input grayscale level and a drive voltage.

7. (Original) The liquid crystal display device according to claim 6, wherein: the lookup table is set for each type of viewing angle characteristics, and the drive voltage setting section selects a lookup table corresponding to viewing angle characteristics.

8. (Original) The liquid crystal display device according to claim 1, wherein: the drive voltage setting section sets a drive voltage in accordance with a program, set in advance, for determining an output grayscale level with respect to an input grayscale level.

9. (Original) The liquid crystal display device according to claim 8, wherein: the program is set for each type of viewing angle characteristics, and the drive voltage setting section selects and executes a program corresponding to viewing angle characteristics.

10. (Original) The liquid crystal display device according to claim 1, wherein: a display mode of the liquid crystal panel is CPA (Continuous Pinwheel Alignment) mode.

11. (Original) The liquid crystal display device according to claim 1, wherein: a display mode of the liquid crystal panel is VA (Vertically Aligned) mode.

12. (Original) The liquid crystal display device according to claim 1, wherein: a display mode of the liquid crystal panel is MVA (Multi-Domain Vertically Aligned) mode.

13. (Original) The liquid crystal display device according to claim 1, wherein: a display mode of the liquid crystal panel is RTN (Reverse Twisted Nematic) mode.

14. (Currently Amended) An electronic device including a liquid crystal display device,
the liquid crystal display device comprising:
a liquid crystal panel comprising a first substrate, a second substrate and a liquid crystal layer, said liquid crystal layer comprising liquid crystal having negative dielectric anisotropy provided between the first and second substrates,

a drive voltage setting section which sets a drive voltage to drive the liquid crystal panel and supplies the set drive voltage to the liquid crystal panel,

wherein:

the drive voltage setting section sets a drive voltage in accordance with viewing angle characteristics of the liquid crystal panel, thereby controlling viewing angle characteristics, and

switches between wide viewing angle characteristics and narrow viewing angle characteristics, wherein

the drive voltage is such that the transmission intensity at oblique viewing angle is increased to strengthen excess brightness and grayscale inversion, achieving narrow viewing angle characteristics, and the transmission intensity at oblique viewing angle is decreased to weaken the excess brightness and grayscale inversion, achieving wide viewing angle characteristics, wherein

in narrow viewing angle operation, a black voltage at the lower end of grayscale at oblique viewing angle which is a drive voltage to be supplied to the liquid crystal pane is set to be larger than a black voltage having basic characteristics,

in wide viewing angle operation, a white voltage at the higher end of grayscale at oblique viewing angle is set to be a voltage which does not cause grayscale inversion while the black voltage at the lower end of grayscale at oblique viewing angle which is a drive voltage to be supplied to the liquid crystal panel has basic characteristics, and wherein

the basic characteristics indicate display characteristics where the transmission intensity at the oblique viewing angle is larger than the transmission intensity at the front when the liquid crystal panel is not subjected to the viewing angle control.

15. (Currently Amended) An electronic device capable of performing at least two types of functions among the following functions: electronic messaging, camera shooting, Internet access, and television reception, and including a liquid crystal display device displaying a state of performing the function during performance of each of the functions,

the liquid crystal display device comprising:

a liquid crystal panel comprising a first substrate, a second substrate and a liquid crystal layer, said liquid crystal layer comprising liquid crystal having negative dielectric anisotropy provided between the first and second substrates,

a drive voltage setting section which sets a drive voltage to drive the liquid crystal panel and supplies the set drive voltage to the liquid crystal panel,

wherein:

the drive voltage setting section sets a drive voltage corresponding to the function to be performed, thereby controlling viewing angle characteristics, and switches between wide viewing angle characteristics and narrow viewing angle characteristics, wherein

the drive voltage is such that the transmission intensity at oblique viewing angle is increased to strengthen excess brightness and grayscale inversion, achieving narrow viewing angle characteristics, and the transmission intensity at oblique viewing angle is decreased to weaken the excess brightness and grayscale inversion, achieving wide viewing angle

characteristics, wherein

in narrow viewing angle operation, a black voltage at the lower end of grayscale at oblique viewing angle which is a drive voltage to be supplied to the liquid crystal pane is set to be larger than a black voltage having basic characteristics,

in wide viewing angle operation, a white voltage at the higher end of grayscale at oblique viewing angle is set to be a voltage which does not cause grayscale inversion while the black voltage at the lower end of grayscale at oblique viewing angle which is a drive voltage to be supplied to the liquid crystal panel has basic characteristics, and wherein

the basic characteristics indicate display characteristics where the transmission intensity

at the oblique viewing angle is larger than the transmission intensity at the front when the liquid crystal panel is not subjected to the viewing angle control.

16. (Original) The electronic device according to claim 15, wherein: the drive voltage corresponding to the function to be performed is set in advance.

17. (Original) The electronic device according to claim 15, wherein: the drive voltage setting section sets the drive voltage in accordance with a switching signal for switching between wide viewing angle characteristics and narrow viewing angle characteristics.

18. (Original) The electronic device according to claim 15, wherein: the drive voltage setting section, under a circumstance where the drive voltage is set to a drive voltage for wide viewing angle characteristics, sets a drive voltage which is to be applied to an arbitrary part of the liquid crystal panel, so as to be a drive voltage for narrow viewing angle characteristics.

19. (Original) The electronic device according to claim 15, wherein: the drive voltage setting section, under a circumstance where the drive voltage is set to a drive voltage for narrow viewing angle characteristics, sets a drive voltage which is to be applied to an arbitrary part of the liquid crystal panel, so as to be a drive voltage for wide viewing angle characteristics.

20. (Original) The electronic device according to claim 15, wherein: the drive voltage setting section, in performing the Internet access, sets the drive voltage corresponding to narrow viewing angle characteristics.

21. (Original) The electronic device according to claim 15, wherein: the drive voltage setting section, in performing the electronic messaging, sets the drive voltage corresponding to narrow viewing angle characteristics.

22. (Original) The electronic device according to claim 15, wherein: the drive voltage setting section, in performing the camera shooting, sets the drive voltage corresponding to wide viewing angle characteristics.